

Virulence profile

Samuel A Lee

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Where did you perform your internship/residency and what field of specialization did you choose?

I completed my internship and residency in Internal Medicine at the Hospital of the University of Pennsylvania. This was one of the formative experiences of my medical career, and was where I truly learned to become a physician. I was fortunate to have been trained by wonderfully gifted and talented faculty, clinicians, and educators. After completing internal medicine residency, I chose to pursue subspecialty training in infectious diseases, largely because of the clinical mentorship of the infectious diseases specialists at the University of Pennsylvania. They were such master clinicians and role models, I could not help but wish to aspire to that level of clinical acumen. In addition, the field of infectious diseases is endlessly fascinating, from both a clinical and scientific standpoint.

What do you like most about your work as a doctor?

I most enjoy being presented with a challenging clinical scenario and being able to make a diagnosis, with the end result of being able to help your patient achieve a positive outcome.

How can one successfully combine working in the clinic with heading a research lab?

It's challenging. The first requirement is perseverance and hard work. The second is surrounding yourself with talented individuals in your research laboratory, and creating an environment of shared

purpose and shared success. Research has been well-described as a marathon, and requires a constant effort over a long period of time, with many sacrifices along the way. Working many, if not most weekends, should be expected and welcomed. The ability to prioritize and delegate responsibilities is a given. Yet at the end of the day, as a primary care physician for patients living with HIV/AIDS and an infectious diseases subspecialist, my first responsibility is always to my patients regardless of what deadline or other pressing obligation there may be.

When and where did you start your own lab?

I began as an assistant professor of medicine in the tenure-track at the University of Texas Health Science Center at San Antonio, and as a member of the San Antonio Center for Medical Mycology. As junior faculty, I greatly benefitted from the mentorship of Dr Thomas Patterson and Dr Jose Lopez-Ribot, both well-known experts in fungal pathogenesis. The environment for studying fungal pathogenesis in San Antonio is outstanding, with multiple investigators studying a wide range of fungal pathogens from multiple aspects, including biology and pathogenesis, animal models, pharmacology, drug discovery, and clinical studies, in a highly collaborative and supportive environment.

How many people work in your lab?

My lab current consists of an adjunct research assistant professor, a post-doctoral fellow, a research assistant, an

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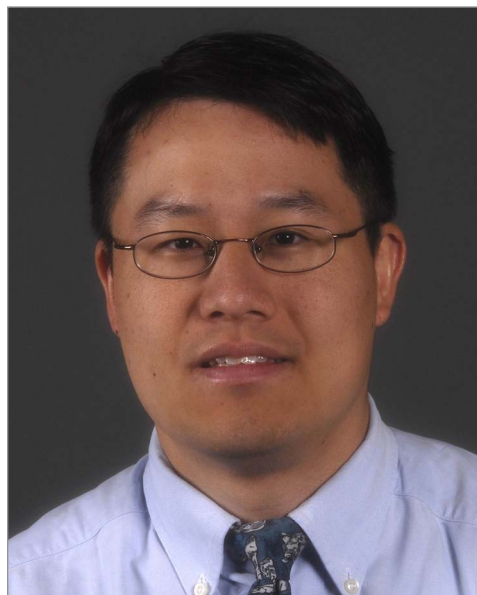
undergraduate honors student, and a volunteer lab assistant. We work closely with two infectious diseases pharmacists, and also host a range of rotation graduate students, and summer students from Albuquerque Academy, a highly regarded private high school in Albuquerque. I am fortunate to work with some very bright and motivated young scientists.

What is your function in your institution?

I am the Chief of Infectious Diseases at the New Mexico VA Healthcare System, and am responsible for clinical and operational oversight of our ID Section. I also am the Medical Director of the ID-HIV clinic, and provide primary and subspecialty care in infectious diseases. On the academic side, I am an associate professor of medicine at University of New Mexico, and in an educational role, serve as the associate program director for our clinical Infectious Diseases Fellowship Program. On the research side, I am the principal investigator of my research laboratory, which studies molecular fungal pathogenesis and translational approaches for treatment of *Candida* biofilms.

Tell us about the most important stages of your professional career.

This is difficult to answer, as every step in my professional career was a necessary step. I began my medical education in the Seven-Year Combined BA/MD Program at Boston University. During medical school, although I found every field interesting, I decided to pursue internal medicine as my field of choice. As a medical student, I chose to do most of my internal medicine-related rotations at Boston City Hospital, where the challenge of providing care to medically underserved patient populations was an amazing experience. In those days, as a student, you really provided an entire range of care for your patient, and made sure necessary steps in patient care happened, from the mundane as simple as patient transport and blood draws, all the way to invasive procedures under supervision. I was also able to arrange a general surgery rotation in Anchorage, Alaska with the Indian Health Service, and a gastroenterology rotation at University



About Dr Samuel A Lee. Samuel Lee studied philosophy and medical science at The Boston University College of Liberal Arts and the Boston University School of Medicine (Boston, MA) within the Seven Year Combined Liberal Arts and Medical Education Program. He received his BA summa cum laude and MD cum laude in 1993. He performed his internship and residency in Internal Medicine at the University of Pennsylvania School of Medicine and Hospital of UPenn (Philadelphia, PA). From 1997 to 2005, Dr Lee was affiliated with Yale University (New Haven, CT) as a clinical fellow and research physician in the Infectious Diseases Section of the Department of Internal Medicine. In 2005 he received his PhD in Investigative Medicine from Yale Graduate School of Arts and Sciences. Subsequently, Dr Lee moved to San Antonio to work as staff physician and assistant professor at the University of Texas Health Science Center. Since 2007, he has been affiliated with the University of New Mexico School of Medicine (Albuquerque, NM) as associate professor of medicine and chief of the infectious diseases section of the New Mexico VA Healthcare System. He also serves as the medical director of the VA ID-HIV primary care clinic, and associate fellowship program director for infectious diseases. Dr Lee's research interests focus on fungal pathogenesis. He studies the molecular pathogenesis of invasive candidiasis, specifically the role of secretion and biofilm formation in *Candida albicans* virulence. His lab also investigates translational aspects of invasive candidiasis, including antifungal drug resistance within biofilms, and the identification of novel and repurposed therapies against *C. albicans* biofilms. During the course of his career, Dr Lee has published more than 50 papers in well-reknowned scientific journals, and he is regularly invited to speak at national and international meetings in the field of infectious diseases. Dr Lee is an active member of various boards and committees, and has served on NIH and VA study sections, and he serves on the editorial board of several journals related to infectious diseases, including *Virulence*.

College Dublin. I really benefitted from learning the art of physical diagnosis, which is learned over many years in their system. During residency, I was able to spend a month in Harare, Zimbabwe at Parirenyatwa Hospital, another amazing experience. I next completed my subspecialty training in Infectious Diseases at Yale University, over a 3 year time period. The research component of my fellowship program was supported by a NIH institutional T32 training grant. I then stayed on another 4 1/2 years at Yale to complete a PhD in Investigative Medicine. During this time my research focus has been on the molecular pathogenesis of *Candida albicans*.

Who were your mentors?

My primary mentor at Yale was Brian Wong. After I joined the Yale Investigative Medicine program, my thesis committee members were Keith Joiner, Margaret Hostetter, Peter Novick, and Craig Roy. In San Antonio, I was mentored by Jose Lopez-Ribot and Thomas Patterson. Dr Lopez-Ribot, in particular, taught me and one of my post-doctoral fellows, Stella Bernardo, how to study biofilms in great detail, and we have continued this work since then.

What makes a good mentor?

A good mentor helps you identify a project or hypothesis worthy of study,

and guides you to ask the right questions and how to answer them. From a practical standpoint, a good mentor provides you guidance on career development, and provides support and guidance for writing grants and manuscripts.

What are your research interests?

Our lab has focused its primary research on the contribution of secretion to filamentation and biofilm formation, an area in which previously little has been defined. Our lab is also studying translational aspects of *Candida* biofilm

formation, including antifungal drug discovery and repurposing, and antifungal lock therapy. We have specifically examined the role of secretion pathway genes and the vacuole in biofilm formation, filamentation, and virulence, and have heavily utilized genetic, molecular biology, and cell biology methods in these studies. We have on-going collaborations with the fungal groups in San Antonio, Houston, New Orleans, and multiple internal collaborations at UNM, including with Dr Larry Sklar, Director, Center for Molecular Discovery in our effort to

discover novel antifungal agents using high-throughput screening technologies, and Dr Karlett Parra, Chair, Biochemistry, who is an expert in the cell biology of yeast V-ATPases.

What do you think you would do if you were not an MD or a scientist?

If I had no limitations, I would be a professional hockey player, or a professional jazz musician. Unfortunately, those aren't possible for me due to lack of the required skill and talent, but I have finally found time to do both recreationally.